**BIOLOGY 2022-23 March 8, 2023**

**Today’s Agenda (Day 120)**

1. HOUSEKEEPING ITEMS

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1. Homework Check:

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1. Class Activity:

🡪 FRIDAY: UPON RETURN FROM BREAK: CONT’D**:** PRESENTATION: How Many CATs – DNA Profiling Simulation

🡪DAY 2: Ch 15 PPT Review

1. **Section 15.2 – Evidence of Evolution**
2. **Section 15.3 – Shaping Evolutionary Theory**

HOMEWORK:

* READ: Chapter 15 – Evolution
* READ: Chapter 17 – Organizing Life’s Diversity
* COMPLETE:
* **STUDY**: Chapter 15 Test

REMINDERS:

* **TEST: Ch 15 🡪 Tuesday, Mar. 9**
* **TEST: Ch 17🡪 March 16**
* **QUIZ: Ch 17 & 18 Vocabulary🡪 March 21**
* **TEST: Ch 18 🡪 March 23**
* **QUIZ: Ch 19 & 20 Vocabulary🡪 April 4**
* **TEST: Ch 19 🡪 March 30**
* **TEST: Ch 20 🡪April 6**
* **TEST: Ch 30 - 31 🡪April 13**
* **QUIZ: Ch 32 Vocabulary🡪 April 18**
* **TEST: Ch 32 🡪April 20**
* **TEST: Ch 33 🡪May 4**
* **QUIZ: Ch 33 & 34 Vocabulary🡪 May 9**
* **TEST: Ch 34 🡪May 11**
* **QUIZ: Ch 35 Vocabulary🡪 May 23**
* **TEST: Ch 35 🡪May 25**
* **QUIZ: Ch 36 Vocabulary🡪 May 30**
* **TEST: Ch 36 🡪June 1**

Chapter 15 – Evolution

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| Adaptive radiation | Allopatric speciation | Analogous structure | Ancestral trait | Artificial selection | Biogeography |
| Bottleneck | Camouflage | Derived trait | Directional selection | Disruptive selection | Embryo |
| Evolution | Fitness | Founder effect | Genetic drift | Gradualism | Hardy-Weinberg principle |
| Homologous structure | Mimicry | Natural selection | Post-zygotic isolating mechanism | Pre-zygotic isolating mechanism | Punctuated equilibrium |
| Sexual selection | Stabilizing selection | Sympatric speciation | Vestigial structure |  |  |

Chapter 17 – Organizing Life’s Diversity

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| Archaea | Binomial nomenclature | Character | Cladistics | Cladogram | Classification |
| Division | Domain | Family | Fungus | Genus | Kingdom |
| Molecular clock | Order | Phylogeny | Phylum | Protist | Taxon |
| taxonomy |  |  |  |  |  |

Chapter 18 – Bacteria and Viruses

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| Bacteria | Binary fission | Capsid | Capsule | Conjugation | Endospore |
| Lysogenic cycle | Lytic cycle | Nucleoid | Pilus | Prion | Retrovirus |
| Virus |  |  |  |  |  |

**BIOLOGY 2022-23 READING GUIDE**

**Chapter 15 Evolution**

DIRECTIONS: Refer to your textbook to respond to the following questions.

1. What did Darwin suspect happen to species on the Galapagos Islands?
2. What did Thomas Malthus suggest would happen to the human population?
3. How did Darwin take Malthus’ ideas to help describe what he had seen in the Galapagos Islands?
4. Describe the process of natural selection.
5. Darwin’s theory of evolution by natural selection has four basic principles that explain how traits of a population can change over time. List the four principles.
6. Define evolution. What is the driving mechanism behind evolution?
7. How does the fossil record provide evidence to support evolutionary change?
8. What is the significance of Archaeopteryx? What organisms did it evolve from?
9. Compare derived traits and ancestral traits.
10. Explain why all of the bones of human, horse, cat, porpoise, and bat (as shown on p.425 of textbook) share a similar structure? How did they develop different functions?
11. Which of the forelimbs mentioned in #10 would most likely resemble a whale’s fin?
12. What are vestigial structures?
13. How does evolutionary theory predict vestigial structures?
14. Eagles and May beetles are not closely related, yet they both have wings. How can this be explained?
15. How does comparative embryology provide support for evolutionary theory?
16. What does the graph below suggest?

Chart, bar chart

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1. Would the cytochrome c of a reptile or a bird be expected to have more amino acid differences when compared to that of a human? Explain (use the graph for this question).
2. What is an adaptation? How are adaptations related to fitness?
3. Compare and contrast camouflage and mimicry.
4. Give an example of how an organism uses mimicry to increase its chances of survival.
5. How is the helplessness of a human baby a consequence of adaptation rather than an evolutionary advantage?
6. Describe what natural selection explains in terms of evolution.
7. Explain the Hardy-Weinberg principle.
8. How does the Hardy-Weinberg principle help explain the following picture?
9. According to the Hardy-Weinberg principle, what are the five conditions that a population in genetic equilibrium must meet to remain that way?
10. What is the consequence of a non-random mating population of organisms (according to H-W)?
11. What is the consequence of a small population of organisms (according to H-W)?
12. Describe the founder effect. Whys is this an example of genetic drift?
13. What effect has the bottleneck had on the reproductive rate of cheetahs?
14. How can mutations benefit a population?
15. List the three main ways in which natural selection alters phenotypes.
16. Give an example of stabilizing selection in humans.
17. Describe 2 examples of directional selection (don’t just list them).
18. Describe one example of disruptive selection.
19. How can sexual selection change the frequency of a trait in a population?
20. Describe an example of how sexual selection has resulted in a different appearance for males and females of a species.
21. Compare and contrast prezygotic and postzygotic isolating mechanisms.
22. Describe an example of a prezygotic isolating mechanism.
23. Describe an example of a postzygotic isolating mechanism.
24. Compare and contrast allopatric speciation and sympatric speciation.
25. Describe and provide an example of adaptive radiation.
26. Give an example of coevolution and explain why your example illustrates the concept.
27. What is the driving force behind convergent evolution?
28. Describe an example of convergent evolution.

**BIOLOGY 2022-23 READING GUIDE**

**Chapter 17 Organizing Life’s Diversity**

DIRECTIONS: Refer to your textbook to respond to the following questions.

1. Why are biologist so concerned with classification?
2. What is taxonomy?  Who was the first person to formally use taxonomic classification?
3. Explain binomial nomenclature.  Give an example.
4. Why is it important that scientists always use an organism’s scientific name rather than its common name?
5. How did the study of evolution affect taxonomy (classification system)?
6. How is genus (define it) an example of a taxon?
7. Which is more inclusive: family or genus?  Explain your answer.
8. How are order, class, and phylum related?
9. How are kingdom and domain related?
10. List and describe the three concepts of species.
11. List a limitation to each of the concepts of species you used in number 10.
12. List a benefit to each of the concepts of species you used in number 10.
13. Compare and contrast analogous and homologous structures?  Which one indicates a shared common ancestor?
14. What are biochemical characters?  How do scientists use them to determine evolutionary relationships?
15. Describe two techniques scientists use to compare DNA sequences.
16. Define cladistics.  What are the two main types of characters used when doing cladistic analyses?
17. In this cladogram (below), which species shares ancestral characteristics with the three organisms being compared?

Diagram

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1. What is the primary assumption made when constructing cladograms?
2. What does the trunk of Darwin’s tree of life represent?
3. What do the branches of Darwin’s tree of life represent?

23. List AND describe the four kingdoms of Domain Eukarya.  Give an example of each.

**BIOLOGY 2022-23 READING GUIDE**

**CH 18 Bacteria & Viruses Reading Guide**

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| 1. Describe what scientists think the first organisms on Earth were like. 2. Why are prokaryotes now divided into two domains?  What are the two domains? 3. Describe the importance of bacteria to humans. 4. Where do Archae live?  What is another name for Archae? 5. Compare and contrast bacteria and Archae. 6. Compare and contrast thermoacidophiles and halophiles. 7. What are methanogens?  Where do they live? 8. **Using** the picture below, describe the function of all of the labeled structures.   Diagram  Description automatically generated   1. List and describe the three general shapes of prokaryotes. 2. How do Gram-positive bacteria look when they are stained?  Why do they look this way? 3. How do Gram-negative bacteria look when they are stained?  Why do they look this way? 4. Describe two different ways that prokaryotes move. 5. Compare and contrast binary fission and conjugation as reproductive methods for prokaryotes. 6. **What** process is shown in the figure below?   Diagram  Description automatically generated   1. Describe the difference between obligate anaerobes and facultative anaerobes. 2. Describe how each of the following types of prokaryotes obtain food: heterotrophs, photoautotrophs, and chemoautotrophs. 3. How do endospores help bacteria survive? 4. Why is nitrogen fixation essential for life on Earth? 5. List three types of food that are all made with the help of bacteria. 6. Describe two different ways bacteria can cause disease. 7. What is a virus? 8. Describe a theory on how viruses evolved. 9. **Describe** the general structure of a virus (be sure to include the definition of capsid in your answer). 10. How do viruses infect hosts cells? 11. Compare and contrast the lytic cycle and the lysogenic cycle in viruses. 12. What is a retrovirus? 13. What are prions?  Name two diseases caused by prions. 14. **What** type of viruses are illustrated below?  How do you know?   Diagram, radar chart  Description automatically generated  A picture containing text, indoor, table  Description automatically generated |